

The mean temperature for July was 79.8°, or 3.3° above the normal, with seven days having maxima of 100° or above; 13th–17th with 100° to 104°; 29th, 100°; and 30th with 101°. The total rainfall amounted to 1.92 inches, or 2.41 inches below the normal; fairly good showers occurred on the 6th, 7th, and 28th, and five light showers between the latter dates.

The mean temperature for August was 82.4°, or 8° above the normal. This is the hottest August of record, and in fact the hottest month, except July, 1901, the mean of which was 85.1°. On only 1 day was the mean temperature below normal, and on 10 days the maxima reached 100° or higher, 105° on the 8th equaling the previous records. The precipitation amounted to 0.18 inch, the smallest amount ever received in August, and 3.44 inches below the normal. A fall of 0.12 inch occurred on the 10th, and the remainder in four light showers after that date.

The drought and heat wave continued into September, and the mean temperature for the first 7 days was 88°, or over 18° above the normal, and on the 4th and 5th 100° was recorded. Light showers amounting to 0.06 inch fell on the 2d.

Compared with previous years, the present period shows that at Omaha there were 19 days with temperatures of 100° or above, while in 1901 there were but 15, 14 of which occurred in July and 1 in June. The precipitation for July exceeded that of last July by 1.06 inches, and August of that year had 0.65 inch, and the mean temperature was 5.5° lower than that of the present August.

On approximately 50 days temperatures of 100° or higher occurred at one or more points in the State from which reports are received.

The damage to crops was confined principally to corn and hay, as the small grain was practically past the stage where it could be seriously affected when the drought became pronounced. Gardens and trees suffered greatly, and on account of the baked condition of the soil fall plowing was seriously delayed. Locally there was little complaint on account of a shortage of water. Opinions as to the damage done to crops vary so greatly that it is impracticable to make any estimate as to the amount of loss, but according to the best of authorities the corn crop will amount to from 25 to 40 per cent of the average yield.

The effect of the continued heat and lack of rain upon human and animal life was not serious, owing to the low humidity that obtained most of the time.

#### REPORT ON THE DROUGHT OF 1913 IN THE VICINITY OF NORTH PLATTE, NEBR.

By A. H. SHILLING, Assistant Observer.

The warm spell of the past summer practically began toward the latter part of May, that month ending with an average excess of temperature of 1°, and there were 3 days with temperatures of 90° or more in the last decade. June temperature was also above the normal with an average daily excess of 2.2° and with 6 days with 90° or more. July taken on an average and comparing with other years, was not unduly warm, as the average temperature for the month, 74.4°, is only 0.5° above the normal. In July there were 13 days with temperatures of 90° or more, which is slightly above the average for such days, and has been equaled or ex-

ceeded in 8 years since 1875, notably in July, 1901, with 27 days. August and the first 7 days in September was the hot period during the summer in this vicinity. August with a mean temperature of 77.3° exceeds the normal by 5.1°, and the temperature in the first week of September averaged 13.3° above normal. There were only 10 days in the period August 1 to September 7, inclusive, on which the temperature did not reach the 90° mark or higher. On August 27 a maximum temperature of 103° was registered, which equals the former record for high temperature for that month, made on August 7, 1878. This was also the highest temperature recorded during the summer.

Comparing the temperature from May to September 7, inclusive, this year with a like period in the years 1881 and 1901, which were warm summers, indicates that this has been the record summer for continuous extreme hot weather in this locality. The mean temperature of 72.6° this year for the period as compared with the means for the same period in 1881 and 1901, 71.4° and 71.0°, respectively, shows that this is the warmest summer since the establishment of the station in the fall of 1874. This present summer also exceeds the record for days with maximum temperature of 90° or more by 50, as compared with 39 days in 1881 and 41 days in 1901. In 1881 and 1901 the last 2 or 3 days of August were free from excessively high temperatures, and the early part of September was comparatively cool, whereas this year the excessive heat continued to September 8.

The rainfall from May 1 to September 7, inclusive, was 9.99 inches, slightly greater than in 1901, which was the driest season in the history of the station. The rainfall was ample and well distributed up to the end of the second decade of June, and around the 1st of July the outlook for crops was most promising, and farmers and merchants were jubilant over the prospect. The rainfall decreased considerably in the last decade of June and the first week of July, just at the critical period for all small grains, and the consequence was that despite the outlook which had been so promising in the early part of the season they gave only fair yields in this part of the State. During July the rainfall, while above the normal, was offset by hot, dry, clear days, and no relief was experienced. In August the rainfall was decidedly deficient and poorly distributed, nearly two-thirds of the total amount falling in two hours on the 19th. The rainfall during the first week in September at this station was 0.01 of an inch, although good rains were reported east and west of here.

The following statements regarding the effects of the hot weather upon crops, water supply, and animal life is obtained principally from Mr. H. C. Diesem, irrigation engineer, Office of Experiment Stations, and Dr. W. T. Pritchard, Bureau of Animal Industry, and also from local merchants and farmers in this vicinity.

*Nonirrigated lands.*—Wheat: Yield fair, averaging from 12 to 15 bushels to the acre, which is slightly below the 10-year average. Corn: Yield of seed complete failure; fodder made a very poor growth and where not cut for ensilage is almost a complete loss. Alfalfa: First crop average yield; succeeding crops very poor, in many cases the plants not starting after the second or third was cut. Potatoes where raised are small, with poor yield. Garden truck after July 1 dried up. Wild hay made about 60 per cent of a crop.

*Sandhills region.*—Corn made a fair growth with a fair yield. Potatoes very nearly average yield and of a good quality. Pasturage good, and ranchmen are hold-

ing their stock later this year than formerly. Cattle are in good shape and if sufficient food can be obtained the farmers will be able to keep them through the winter.

*Irrigated lands.*—(Irrigated area in Nebraska for 1913 is about 300,000 acres, nearly all of which lies within the southwestern and western portions.) Where sufficient water supply has been available fair to good crops have been grown.

*Water supply.*—Practically all the streams in this section of the State carry what is known as the "underflow." The water supply has, therefore, been affected only to the extent that the water table has been lowered from 1 to 3 feet according to the locality. There has been no report of wells going dry, and the supply has been such that there was no scarcity of water.

No especial inconvenience resulted to human life from the hot weather and there were no prostrations or deaths from extreme heat reported in this vicinity.

#### DROUGHT IN OKLAHOMA, JULY AND AUGUST, 1913.

By J. P. SLAUGHTER, Section Director.

Weather conditions were favorable during the spring and early summer, ending with general and copious rains June 30 and July 1 over nearly the whole State. Up to the middle of July the condition of all crops was excellent, but by the close of the month nearly the whole State was facing a serious drought and conditions grew steadily worse until the general rains of September 8-9.

There were no general rains from July 3 to September 7, such local showers as occurred being widely scattered and light. The injurious effects of the failure of the usual summer rains were augmented by clear skies, unusually high day temperatures and occasional hot, drying winds. Intense heat was practically continuous from July 4 to August 7. There were but two short periods of seasonable day temperatures, July 20-22 and August 22-24, and in each instance barely normal conditions were reached. The nights were reasonably cool and pleasant during this entire period and there was no material suffering by man or beast as a direct result of the heat.

For the 68-day period July 2 to September 7 the total rainfall at Oklahoma City was 0.57 inch, as compared with a normal of 7.33 inches. The mean temperature for July was 81.7° and the average daily maximums 92.6°; for August the mean was 84.8° and the average of the daily maximums 97.6°.

For the State the rainfall for the 60-day period July 2 to August 31 averaged 1.63 inches, as compared with a normal of 5.85 inches. The average temperatures for July and August were 83.8° and 85.5°, respectively, while the averages of the daily maximums were 97.3° and 101.3°, respectively. The figures for the August State mean temperature have been exceeded twice, August, 1899, and July, 1901. The August average of the daily maximums is the highest of record, exceeding the average of July, 1901, by nearly 1°. Summing up, it may be said that the temperature extremes experienced this summer are equaled nearly every year and have been exceeded several years, but for duration of intensely hot weather July and August of this year establish a new record for Oklahoma.

The drought cut the condition of crops on an average close to 50 per cent. The ultimate result, however, on crop yields is still a question of doubt and depends largely on the date of killing frost and the intervening weather conditions. It is estimated at this writing, September 16, that the loss will not be so large as the above figures indicate. Cotton will suffer most heavily and the per acre yield will almost certainly be the lowest in the history of the State. Early planted corn matured with but slight injury or loss; late planted corn is largely a total loss and the same may be said of a considerable portion of the late planted kafir, milo maize, and broom corn, large acreages having "fired." The alfalfa crop will be short one cutting; the last cutting will be light and the stand has been materially damaged in some localities. Feterita, introduced in recent years, stood the drought and will make good yields.

The Cimarron, North Canadian, and South Canadian Rivers were dry during August; in many places sand and dust were blowing along the river beds. The smaller streams and many springs and shallow wells failed, and there was a serious shortage of water for both stock and domestic purposes, more especially in the western half of the State. Some of the cities and towns were using water sparingly and were face to face with a genuine water famine when the September rains came. Farmers were impelled to market large numbers of cattle and hogs because of scarcity of water, failure of pastures, and the anticipated shortage of feed, but there was no loss of stock because of lack of water.

The drought emphasized the necessity of the farmers of Oklahoma adopting the methods advised by the farm demonstrators of the Agricultural Department, and the State. In numerous instances that came under the writer's personal observation only a barbed wire fence separated a green and fairly thrifty field of kafir or corn from one that was burned and dead; the difference in the two fields was due solely to preparation of the seed beds and the methods of cultivation.

The most disastrous drought in the history of the State was that of 1895 and was due to the failure of rains in the fall of 1894 and the winter, spring, and early summer of 1895. There was no unusually hot weather that year and precipitation was abundant in July, August, and September. In 1901 conditions as regards temperature were much the same as this year, except that the period of intense heat began the latter part of June and ended during the first decade in August. The rainfall was deficient from June 20 to September 30, but averaged nearly twice as much as during the drought of this year. Precipitation was deficient during the spring and summer of 1910 and the season generally droughty, but there were no protracted periods of intense heat that year. In 1911 the May and June precipitation was light and during practically the whole month of June and the first 10 days of July temperatures were abnormally high; the mean temperature for the State for June was 84.4°, or 8.6° above normal; the average of the daily maximums was 99.1°, with the extremes ranging between 105° and 112°. Grain was greatly damaged that year, but abundant rains and seasonable temperatures in the late summer and early fall saved the cotton and forage crops.

While the recent drought has greatly damaged crops, the consensus of opinion of the best posted men in Oklahoma is that in the aggregate the crop yield for the State this year will certainly equal that of 1910 or 1911.